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## PROVISIONAL SPECIFICATION

### Improved Surgical Sutures and like Surgical Material and the Manufacture thereof

I, ERNEST GORDON GREVILLE, a British Subject, of 167-173, Gray's Inn Road, London, W.C.1, do hereby declare the nature of this invention to be as follows:—

This invention relates to surgical sutures and like surgical material and to the manufacture thereof.

Heretofore, surgical sutures have been composed of silk or linen thread, or of catgut.

Silk or linen sutures have the advantage that they can be sterilised by boiling or treatment in an autoclave but they present the disadvantage of not being absorbable by the body tissues.

Catgut sutures are more usually favoured as they are absorbable by the body tissues.

Catgut is, however, liable to contamination, particularly from tetanus, and generally it cannot be sterilized by boiling or treatment in an autoclave in the usual manner.

Catgut sutures have, therefore, to be manufactured under aseptic conditions and require to be specially sterilized and specially packed.

Catgut, moreover, is comparatively expensive and the special processes necessitated for its sterilization and packing, when intended for use as surgical suture material, add materially to its expense.

An object of the present invention is to produce a surgical suture and like surgical material which is absorbable by the body tissues and which can be sterilized by boiling or treatment in an autoclave in the usual manner and/or by antiseptics and, moreover, which can, with safety, be packed in the ordinary way.

A surgical suture or like surgical material according to the present invention is composed of an alginate salt formed into a filament or made into strip or sheet form.

The invention also comprises a surgical suture composed of an alginate salt formed into a filament, either the filament being treated with a protein, or the alginate salt having a protein incorporated with it, for imparting toughness to the suture.

In one example of the manufacture of

surgical sutures in accordance with the invention, drawn out mono or poly filaments composed of an alginate salt are immersed in a bath of a coagulable protein solution, which is brought to coagulation either by heating to a temperature of about 60°-70° C. or by the addition of a coagulating substance such as tissue extract.

Proteins such as fibrin, plasma, or the like are suitable for the purpose.

The filaments so treated are dried or allowed to dry, whereupon their strength will be found to have increased.

The dry filaments are woven, twisted or braided to form sutures of the required calibre.

Alternatively, the alginate salt can be made into a viscous solution with the protein and the filaments can then be drawn from such viscous solution.

Suitable antiseptics, such as flavine, can be applied to the filaments either by impregnation or by painting or wiping or, alternatively, such compounds can be added to the alginate or alginate-protein mixture before drawing it into filaments.

As an example of the application of the invention to the manufacture of surgical material other than sutures, the alginate salt together with a bacteriostatic, and, if desired, also a protein for toughening purposes, can be made into strips or sheets for application between body tissues to allow such tissues to heal without growing together, the strip or sheet being absorbed by the tissue in due course.

Calcium and beryllium alginates have been found to be satisfactory in the manufacture of alginate sutures, strips and sheets as above described, in accordance with the invention, but it is to be understood that the invention is not restricted to the use of these particular alginates.

Control of the rate of absorption of the sutures, strips or sheets by body tissue can be effected by the introduction of selected artificial resins during the last stage of manufacture.

Dated this 12th day of November, 1943.

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[Price 1/-]